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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,297	03/08/2007	Joseph Haiun	3338.80WOUS	4605
24113 7590 05/08/2009 PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100				
EXAMINER				
HWU, DAVIS D				
ART UNIT		PAPER NUMBER		
3752				
MAIL DATE		DELIVERY MODE		
05/08/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/551,297

**Applicant(s)**

HAIUN, JOSEPH

**Examiner**

Davis Hwu

**Art Unit**

3752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SE-US)  
Paper No(s)/Mail Date 9/23/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 14-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In claims 14 and 22, since P1 appears to be the pressure of the space in which the liquid is to be sprayed, it is unclear how spray can take place if the liquid is to be ejected from the nozzle at the pressure P1. The nozzle ejection pressure must be higher than the space into which the liquid is to be ejected into, otherwise no movement of the liquid can take place and no spraying can take place.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 14-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 14 recites the limitations "the saturated vapor pressure", "the pressure P1", "the gaseous medium", "the generatrix", and "the exit section." There is insufficient antecedent basis for this limitation in the claim.

6. Claim 22 recites the limitations "the same spray nozzle", "the flow", "the pressure P1", "the gaseous medium", "the saturated vapor pressure Ps", "the liquid jet", and "the generatrixes." There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaiser in view of Asakawa et al.

Gaiser discloses a device to spray an overheated liquid in the form of very fine droplets (vapor) at a very high speed by pump 15, the overheated liquid having a temperature  $T_o$  and a pressure  $P_o$  greater than the saturated vapor pressure  $P_s$ , the vapor pressure being greater than the pressure  $P_1$  of a gaseous medium 23 in which the liquid is sprayed, comprising a nozzle body 22 fixed on a support allowing the supply of overheated liquid, the nozzle body comprising a conduit where the overheated liquid circulates. Asakawa et al. teaches a nozzle comprising a conduit B2 followed by a convergent head B3 and by an injector C where the fluid attains speed to open onto a divergent and speed attainment nozzle D. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device of Gaiser by replacing the nozzle with a nozzle as taught by Asakawa et al. to provide speed attainment for the liquid. Due to the heating, the liquid jet partially evaporates

and instantaneously explodes under the effect of the pressure difference between the liquid and the ambient medium of the nozzle to form a mixture of fine droplets and vapor, a generatrix of the divergent nozzle presenting a discontinuity or an angle at its intersection with that of the injector (see Figures 4 and 6), and the exit section of the nozzle is sized so that the mixture is ejected from the nozzle at the maximum ejection speed.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patent to Kay et al. and Barnes are pertinent to Applicant's invention.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davis Hwu whose telephone number is (571)272-4904. The examiner can normally be reached on Mon-Friday 8:00-4:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

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Art Unit: 3752

/Davis Hwu/

Primary Examiner, Art Unit 3752